

REMARKS

Claims 1-9 have been examined and withdrawn claims 10-15 are canceled without prejudice or disclaimer. Furthermore, Applicants have canceled claim 16 without prejudice or disclaimer.

Claim Rejections - 35 U.S.C. § 103(a)

The Examiner rejected claims 1-9 and 16 under § 103(a) as being unpatentable over Avinash (US 6,782,137) in view of alleged obvious modifications. Applicants traverse this rejection as set forth below.

Applicants submit that the Examiner has failed to establish a *prima facie* case of obviousness by providing a motivation to modify Avinash based on hindsight with no support from the applied reference. In making this rejection, the Examiner alleges that Avinash teaches or suggests most of the features recited in the claims, but concedes Avinash fails to teach or suggest that the smoothing intensity is computed on the basis of the frequency of noise. (Office Action, p. 4) To remedy this deficiency, the Examiner alleges that:

(1) Avinash teaches the low frequency variation and high frequency variation in the image preserve the appearance of lighter and darker regions in the reconstructed image (*citing* co. 4, lines 47-56; col. 6, lines 3-7); and

(2) computation is based on the variations between the high and low intensity regions. (*citing* col. 10, lines 1-18, lines 56-58).

Then, somehow the Examiner arrives at the conclusion that it would have been obvious of one of ordinary skill in the art to consider the frequency variation of the intensity relates to the

frequency of noise since Avinash's teaching is for improving the contrast-to-noise ratio without enhancing image artifacts.

In contrast, Applicants submit that no portion of the technique described in Avinash is directed to noise. The only portion that mentions noise is in the background of the invention, which states:

For example, in the medical diagnostics field, image data may be acquired through various modality systems, including magnetic resonance imaging (MRI) systems, computed tomography (CT) systems, x-ray systems, ultrasound systems, and so forth. Depending upon the imaging modality, the image data may be further processed, filtered, enhanced, scaled, and so forth to reduce noise and to render more visible particular features of interest.

(Office Action, Background of the Invention, col. 1, lines 34-43).

No other portion of Avinash mentions or discussed noise. Even further, there is no discussion or contemplation of the frequency of noise. To the contrary, Avinash is directed to the problem associated with viewing images (e.g., x-rays, CT scans, or the like) on a softcopy display, such as a computer monitor. As described in Avinash, when viewed on a display, certain features may be less distinct than when viewed on a photographic film. (col. 2, lines 35-39). The invention of Avinash is geared toward enhancing these features only and no portion is directed to noise or a contrast-to-noise ratio as alleged by the Examiner.

Specifically, Avinash teaches a method consisting of two steps, an adaptive equalization process followed by adaptive contrast boosting. The adaptive equalization merely draws the whole image data, noise included, into the dynamic range of the output device. (col. 5, lines 18-21). Following this process, the adaptive contrast boosting "entails shrinking the data matrix, smoothing the image data, generating a gain function, performing spatial independent scaling based upon the gain function, expansion of the data matrix by bilinear interpolation, and unsharp

masking of the resulting image data.” (col. 6, lines 14-18). None of these functions, as disclosed, even contemplate the frequency of noise. Thus, there is no support for the Examiner’s conclusory statement that “Avinash’s teaching is for improving the contrast-to-noise ratio.” (Office Action, p.4, 2nd full par.).

The Examiner’s alleged motivation is wholly unsupported and, therefore, the Examiner has failed to establish *prima facie* obviousness. Thus, Applicants submit that claims 1-9 and 16 are allowable for at least this reason.

Additionally, even if Avinash is modified as the Examiner suggests and one skilled in the art would not consider Avinash to teach or suggest, at least, that the smoothing intensity is computed on the basis of a distribution expression representing the frequency of noise with respect to the predetermined color component, as recited in claims 1, 4, and 7. As discussed above, the only reference to noise is stated as:

Depending upon the imaging modality, the image data may be further processed, filtered, enhanced, scaled, and so forth to reduce noise and to render more visible particular features of interest.

(Avinash, col. 1, lines 40-43).

Therefore, even if modified by considering the frequency of the intensity related to the frequency of noise, the modified disclosure of Avinash fails to teach or suggest a smoothing intensity computed on the basis of a distribution expression representing the frequency of noise with respect to the predetermined color component. This feature is simply not taught or suggested by Avinash or by the Examiner’s attempted hindsight reconstruction.

Thus, Applicants submit that claims 1, 4 and 7 are allowable for at least this reason. Additionally, Applicants submit that claims 2, 3, 5, 6, 8 and 9 are allowable, at least because of their dependency.

Conclusion

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,

A handwritten signature in black ink, appearing to read 'D. P. Emery', written over a horizontal line.

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